Router components

- control plane (Brain)
- Data plane (Brawn)
  - forwarding related

control traffic ← [processing related]

- software Based routers
- Hw " "
- Hybrid " "

sw based routers → shared control & data plane

→ General purpose CPU (slow & smart)

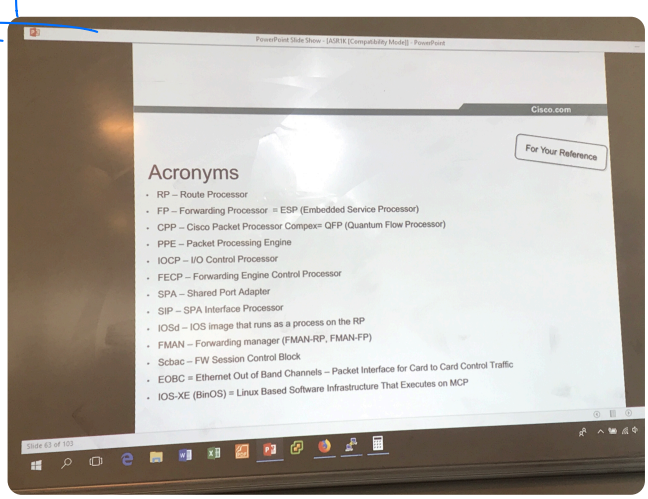
→ CPU responsible For all operations

800/2800/2900/3900/7200 series

PFR/OER Load sharing

EIGRP (FD/FS)

ASR1K.ppt



iPerf : mesurment for Bandwidth for routers [speed test tool]

ixia : best company for test network
ixiacom.com

SDM ← موقع الشرح البرنامج ?

QoS

CSR(conf)# access-list 100 permit ip any any dscp ef
↳ = 46/48 → أولوية عالية ل voice

(--) #access-list tcp any any range 2000 2999

( ) # class-map CL-QOS
)#match access-group 100

do sh class_map
#policy-map PL-QOS

class CL-QOS

#set

#priority 5000

#sh policy-map

(conf)# int g2

(Config-if)# service-policy out PL-QOS

#sh policy-map int g2

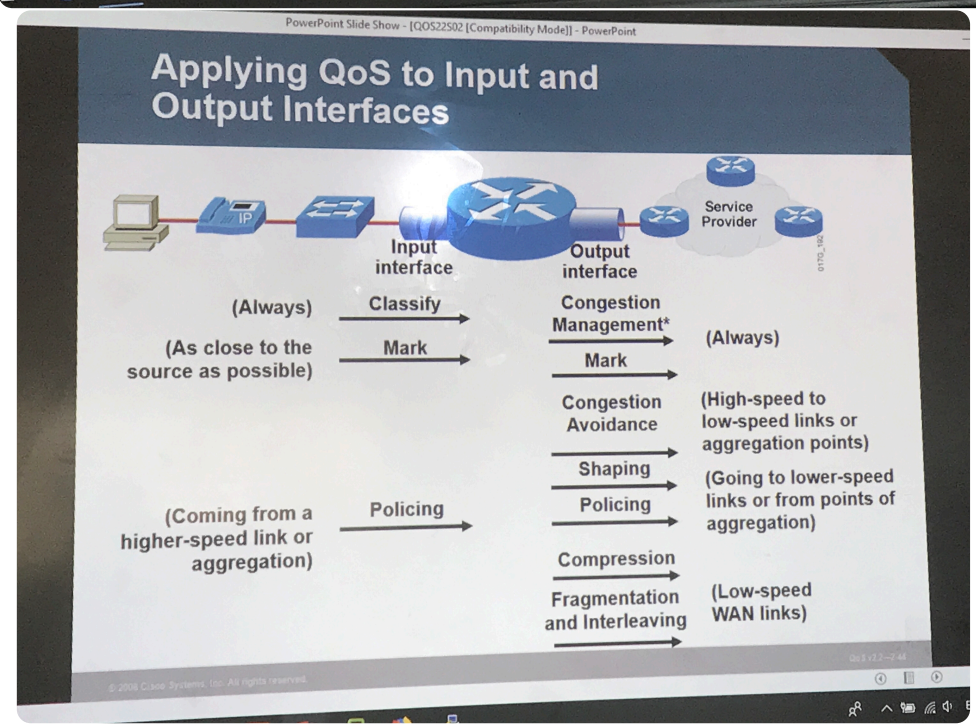
RSVP ⇒ تستخدم لوضع Label للترافيك
حيث تتحكم فيها لاحقا بمقدار معين كما تحجز BW
لتمرير و كمية معينة

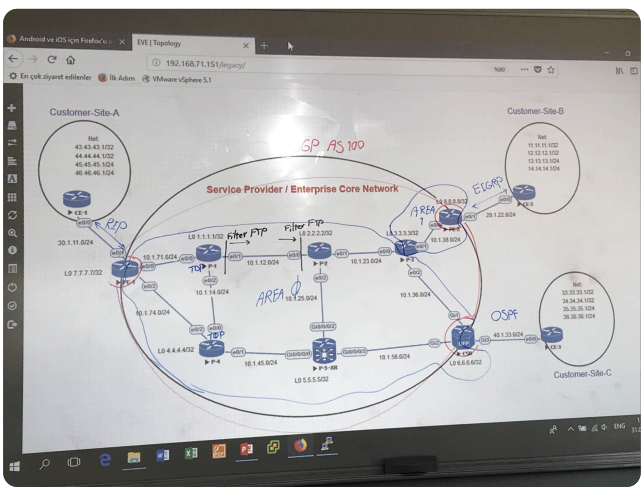
Enabling RSVP

- **Enable RSVP**
  - `Router(config-if)ip rsvp bandwidth [interface-kbps] [single-flow-kbps]`
- **Disabling Reserving Interface Resources**
  - `Router(config-if)ip rsvp resource-provider none`
- **Disabling Packet Classification**
  - `Router(config-if)ip rsvp data-packet classification none`

QoS Mechanisms

- **Classification:** Each class-oriented QoS mechanism has to support some type of classification.
- **Marking:** Used to mark packets based on classification, metering, or both.
- **Congestion management:** Each interface must have a queuing mechanism to prioritize transmission of packets.
- **Congestion avoidance:** Used to drop packets early to avoid congestion later in the network.
- **Policing and shaping:** Used to enforce a rate limit based on the metering (excess traffic is either dropped, marked, or delayed).
- **Link Efficiency:** Used to improve bandwidth efficiency through compression, link fragmentation, and interleaving.

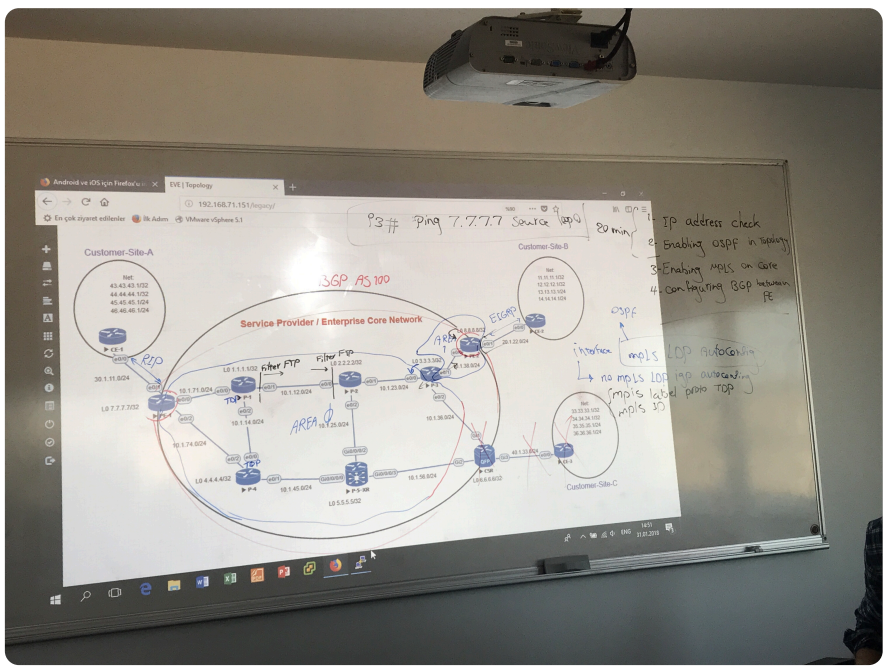


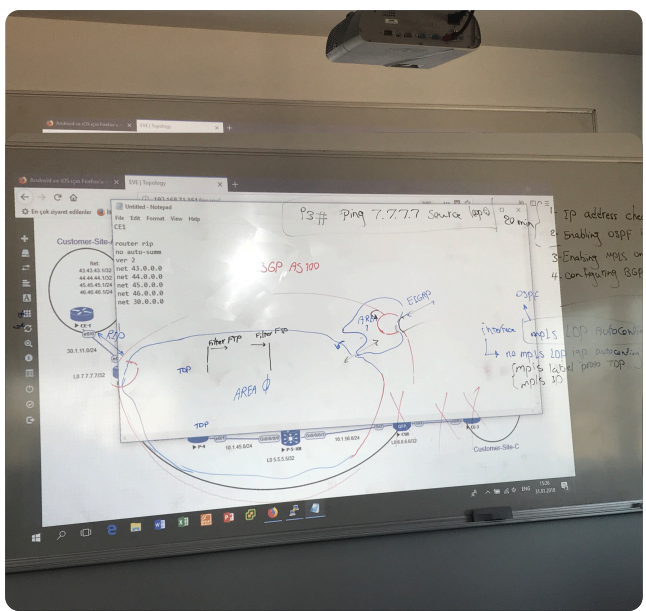


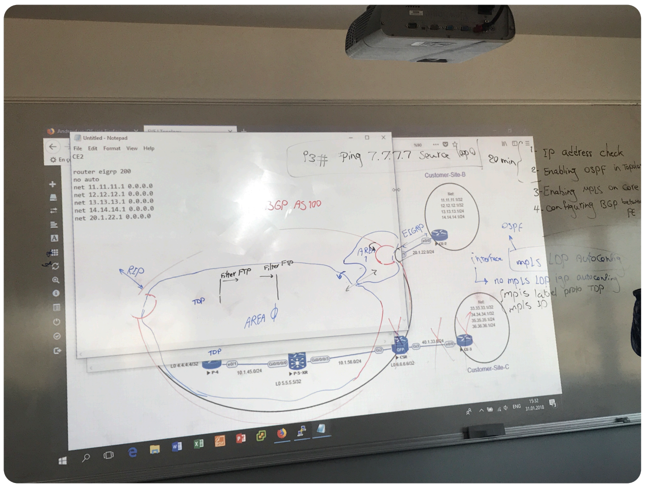
secure mpls connection between routers

P-1(config)# mpls ldp neighbor 2.2.2.2 password cisco

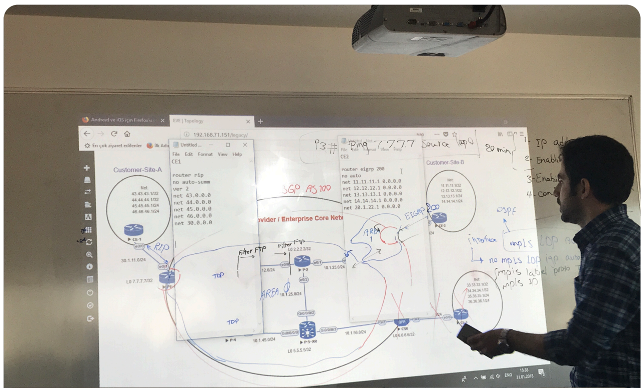
P-2(config)# mpls ldp neighbor 1.1.1.1 password cisco

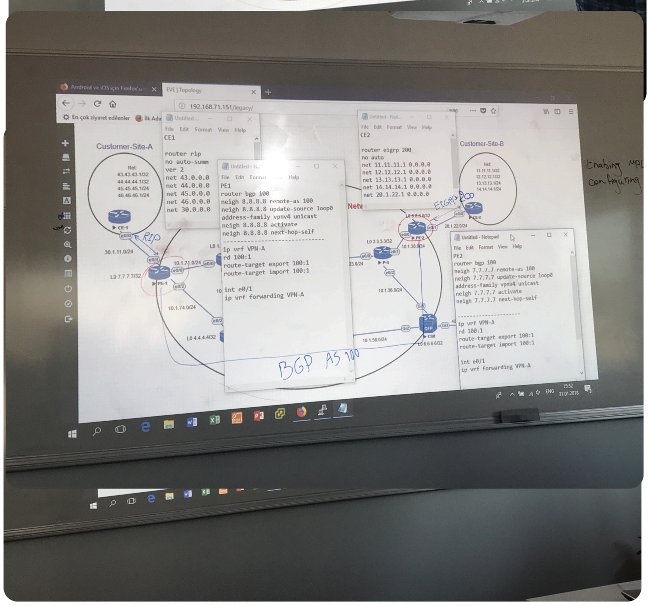




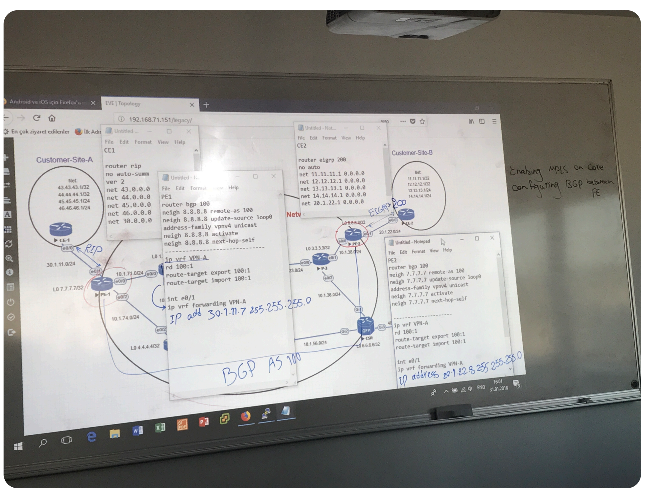


router eigrp 200
no auto
net 11.11.11.1 0.0.0.0
net 12.12.12.1 0.0.0.0
net 13.13.13.1 0.0.0.0
net 14.14.14.1 0.0.0.0
net 20.1.22.1 0.0.0.0
BGP AS 100

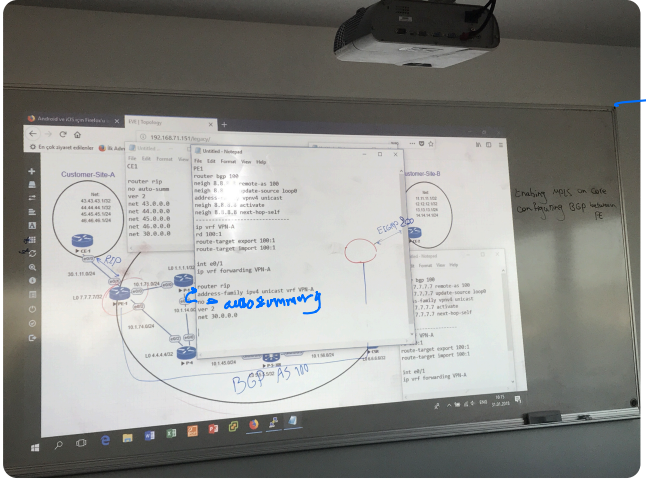




BGP AS 100



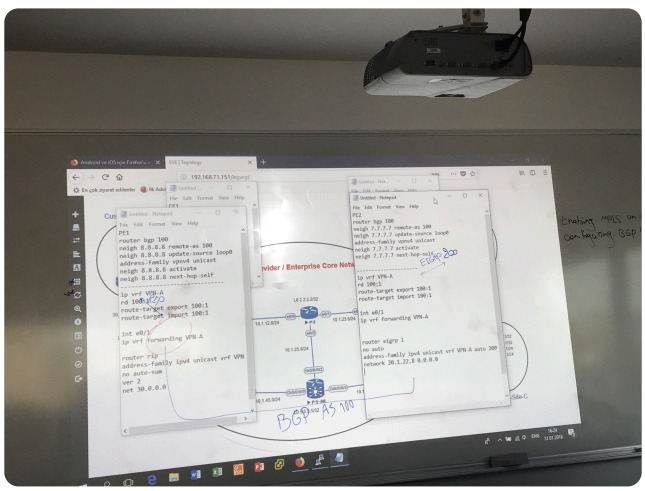
BGP AS 100

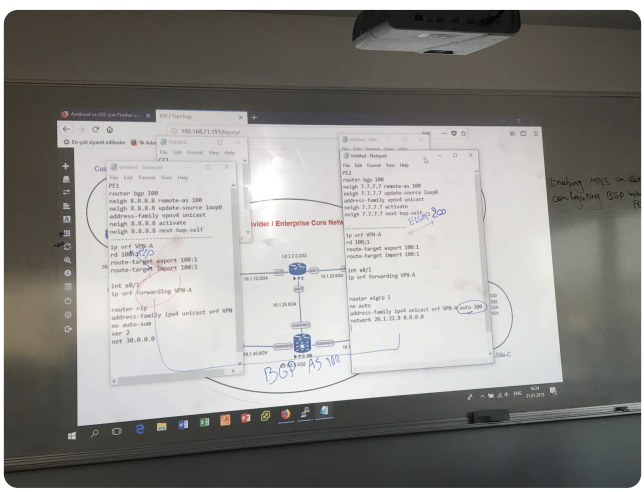


sh ip route ~~vrf~~ vrf VPN-A

sh ip route vrf VPN-A

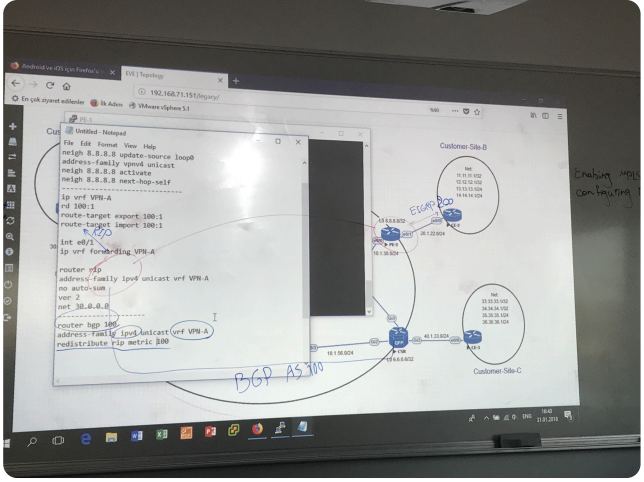
ping vrf VPN-A 30.1.11.1

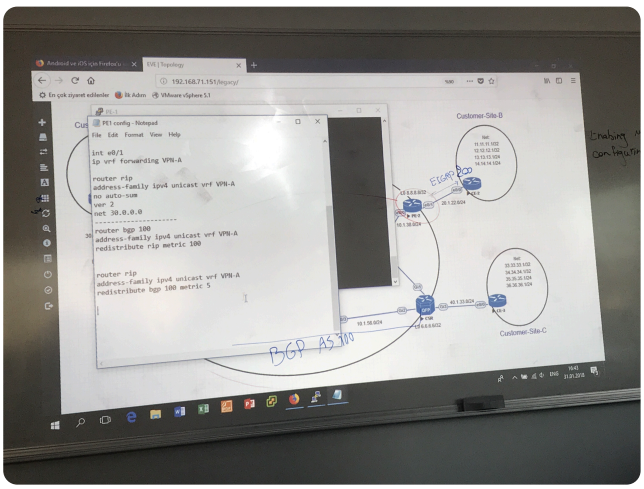


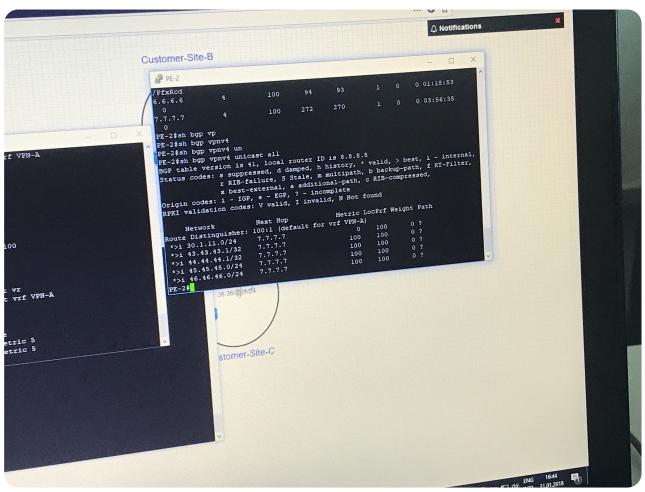


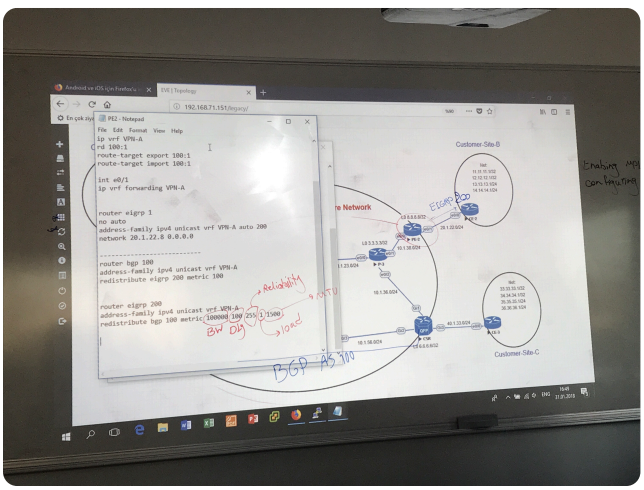
sh bgp vpnv4 unicast all

sh ip bgp summary


Customer-Site-B
Customer-Site-C
EIGRP 200
RIP
BGP AS 300


Customer-Site-B
Customer-Site-C
EIGRP 200
BGP AS 300


Notifications
Customer-Site-B
Customer-Site-C


Customer-Site-B
Customer-Site-C
EIGRP 200
BGP AS 300

ASR1000-002-01. Name. Surname

↳ ASR1000 → subject

MPLS002-01

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